DETAILED ACTION

1. This is a non-final office action in response to the filing of the Request for Continued Examination filed on 23 February 2011. Claims 10-26 are currently pending examination below.

Claim Objections

2. Claim 20 is objected to because of the following informalities: the limitation "within the flow channel and to a burner for combustion in the burner upon existing the flow channel" should read "upon exiting the flow channel". Appropriate correction is required.

Claim Rejections - 35 USC § 102

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

4. Claims 10-14, 19-24 and 26 are rejected under 35 U.S.C. 102(b) as being anticipated by Gulati et al. US 5,644,918.

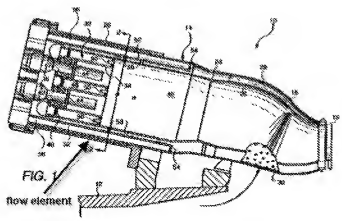


FIG. 1

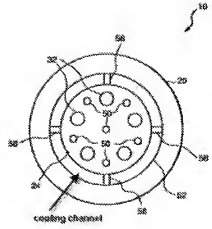


FIG. 2

5. Regarding claim 10, referring to figures 1 and 2, Gulati discloses a combustion chamber for a gas turbine 10, a combustion chamber wall 28, a liner 26 formed from a plurality of heat shields on an inside of the combustion chamber wall; an inner space (labeled above as cooling channel) formed between the heat shield elements and the combustion chamber wall and exposed to a cooling medium via cooling holes 30, wherein the liner is made for a leak-free material such that the inner space is configured to direct the cooling medium along a cold side of the liner and within the inner space, and to a burner for combustion in the burner upon exiting the inner space, *see column*

2, lines 26-43, the liner is interpreted as leak-free because it is not shown to have any dilution or film cooling holes, a flow element 56 arranged in the inner space for selective adjustment of a cooling medium stream, where the flow element occupies a portion of the cross sectional area of the cooling channel which would increase the velocity of the air, wherein a longer side of the rectangular body is adjacent and in contact with the combustion chamber wall such that the longer side is defined by a plane that is substantially parallel to and encompasses the combustion chamber wall.

6. Regarding claim 11, Gulati discloses a flow channel formed between the liner 26 and the resonator/flow element 56 for cooling medium and the flow element causes the flow velocity of the cooling medium stream to be increased compared with the flow velocity upstream of the flow element. As noted in the previous office actions, conservation of mass yields the density*velocity*area at state 1 equals the density*velocity*area at state 2 where the decrease in area (cross sectional area) caused by the flow element will cause an increase in velocity. The Applicant has not argued any effects caused by density changes.

7. Regarding claim 12, Gulati discloses a heat shield portion/element (the upstream portion) is assigned a respective flow element portion for the purposes of cooling a thermally heavily loaded wall section of the heat shield element.

8. Regarding claim 13, Gulati discloses a heat shield element 26 is a single-shell hollow vessel with a cavity in which the flow element is disposed so that the flow element is encompassed by the single-shell hollow vessel and the heat shield element is mounted to the combustion chamber wall.

9. Regarding claim 14, Gulati discloses the heat shield element has a surface region with a surface contour curved along a longitudinal axis and a transverse axis. The heat shield 26 is annular and thus curved in along its length, i.e. longitudinal axis, and along the circumference, i.e. the transverse direction.

10. Regarding claim 19, referring to claim 10 above, Gulati discloses all elements.

11. Regarding claim 20, referring to figure 1 and claims 10-11, Gulati discloses a surface of the flow element 52 located near a cold side of the heat shield 24 such that the flow channel becomes more narrow, the flow channel configured to direct a cooling medium (air) along the cold side of the heat shield and within the flow channel and to a burner for combustion in the burner upon exiting the flow channel; a surface contour 52 of the surface adapted to approximately match a surface contour of the cold side of the heat shield element, the surface contour is concentric to the liner, wherein a longer side of the flow element and the surface is adjacent and in contact with the combustion chamber wall such that the longer side is defined by a plane that is substantially parallel to and encompasses the combustion chamber wall.

12. Regarding claim 21, referring to claim 11, Gulati discloses a flow element such that the cooling medium will accelerate when the medium passes by the flow element surface in order to increase the velocity.

13. Regarding claim 22, referring to figure 1, Gulati discloses the flow element has a rectangular cross section, i.e. rectangular shape, and the surface portion of the cross section forms the longer side of the rectangle.

14. Regarding claim 23, referring to claim 12 above, Gulati discloses all elements.

15. Regarding claim 24, referring to claim 13 above, Gulati discloses all elements.

16. Regarding claim 26, Gulati discloses the surface of the flow element is parallel to the cold surface of the heat shield element.

Claim Rejections - 35 USC § 103

17. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

18. The factual inquiries set forth in *Graham* v. *John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

19. Claims 15-18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Gulati and Senior US 6,122,917.

20. Regarding claims 15-18, Gulati discloses all elements but does not explicitly disclose the manner in which the flow element 56 is attached to the combustion chamber wall or the material composition of the flow element.

21. The use of welding and sheet metal components are well known in the field of gas turbine engines as shown by Senior. Combustors typically use various metals,

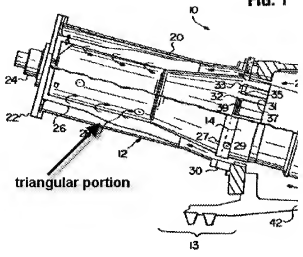
metal alloys, or ceramics to form walls so as to withstand the high temperatures and pressures within the combustor. Welding offers a simple strong means of attaching structures with gas turbines. *See column 4, lines 56-end.*

22. It would have been obvious to one of ordinary skill in the art at the time of the invention to weld a sheet metal flow element 26 to the combustor wall as a means of mounting the flow element to the wall of Gulati as taught by Senior as part of an obvious use of a known technique, in this case the use of sheet metal and welding, to improve similar devices, in this case flow elements, in the same way. *See MPEP 2141 III C.* It is further noted that welds are reversible and therefore the flow element is detachably mounted.

23. Claim 25 is rejected under 35 U.S.C. 103(a) as being unpatentable over Gulati in view of Beebe et al. US 5,826,429.

24. Regarding claim 25, Gulati discloses all elements, including a flow sleeve/element 56, except for a triangular shape.

FIG. 1



25. Referring to figure 1, Beebe teaches a flow sleeve with a triangular portion that gradually increases the size of the sleeve.

26. It would have been obvious to one of ordinary skill in the art at the time of the invention to include a triangular portion to the flow sleeve of the sleeve of Gulati, as taught by Beebe, as part of an obvious combination of prior art elements, in this case the triangular flow sleeve of Beebe for the rectangular flow sleeve of Gulati, according to known methods to yield predictable results, in this case to control the flow of cooling air through the combustor. *See MPEP 2141 III A; Beebe column 4, lines 1-17.*

Response to Arguments

27. Applicant's arguments with respect to claims 10-26 have been considered but are moot in view of the new ground(s) of rejection.

28. The Examiner would like to note that the term "flow element" is broad and provides little to no structural limitations. Additionally, the function achieved by the "flow

element" would be inherently accomplished by any structure that serves to reduce the cross sectional area in the cooling passage of a gas turbine engine.

Contact Information

Any inquiry concerning this communication or earlier communications from the examiner should be directed to GERALD SUNG whose telephone number is (571)270-3765. The examiner can normally be reached on M-F 9am-5pm PST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Ehud Gartenberg can be reached on (571) 272-4828. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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/Gerald L Sung/
Examiner, Art Unit 3741
6 October 2011

/Ehud Gartenberg/
Supervisory Patent Examiner, Art Unit 3741